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EXAMINER

SOUW, BERNARD E

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 06 19 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/502,859

Applicant(s)

ISHIKAWA ET AL.

Examiner

Bernard E Souw

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☒ Claim(s) 29 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to because it is not clear which part(s) of the dime 16 in Fig. 1 the labels 10, 12 and 14 are referring to.

Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

Specification

2. The disclosure is objected to because of the following informalities:
 - (a) On pg. 5/line 14, the word "1 MeV γ s" should better read "1 MeV γ -radiation".
 - (b) On pg. 9/line 11, the expression " $3 \times (2^5 = 32)^2$ or 3048 .." is arithmetically incorrect.
 - (c) On pg. 14/line 22, the statement "Modern strip gamma-ray detectors with as well as Compton" is not understandable. The word "with" should be omitted.

Appropriate corrections to (a)-(c) are required.

3. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to

comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are:

(a) On pg.7/ll.5-8, the wording "... the then-observed ratio of the line intensities constitutes a "clock" from which an 'elapsed time' reading may be determined as precisely as desired (e.g., $\pm 1-4\%$, when attempting to "tell time" to 3-12% relative accuracy)", is unclear, inaccurate and also misleading. The information provided in the specification is thus not adequate to teach a prospective user how to use Applicant's invention. To overcome this objection, the following phrase is tentatively suggested by the examiner:

".... the then-observed ratio of the line intensities, *which may be determined as precisely as desired by increasing the counting interval*, constitutes a "clock", from which an 'elapsed time' **reading** can be traced back, e.g., *the line intensity ratio to $\pm 1-4\%$ accuracy when attempting to "tell time" with $\pm 3-12\%$ **relative** accuracy*",

(b) Still on pg.7/ll.5-8, a $\pm 1-4\%$ accuracy in counts is numerically correlated to a $\pm 3-12\%$ accuracy in 'elapsed time' (since creation) only under a certain condition or assumption regarding the counting interval, the individual decay rates, and the statistical percentage of error reading desired. If numbers are recited, the underlying parameters that have led to those specific numbers must be specified. In this respect, the information provided in the specification is not sufficient to teach a prospective user how to use Applicant's invention. Alternatively, no number is to be recited at all, in order not to mislead the prospective users.

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(c) On pg.9/ll.4-5, in the wording "... then $\sim 3 \times (2^N)^2$... statistically reliable estimate ...", the number "3" has been made under a certain assumption over a specific statistical error desired, which is nowhere recited or mentioned in the specification. Again, the information provided in the specification is not sufficient to teach a prospective user how to use Applicant's invention

(d) On pg.9/line 7, the requirement "the line-strength must be read out to 1 part of 2^N " is not imposed on the reading of *instantaneous* counts, as implicated, but must be on the *result of time-zeroed activity* calculated back from the instantaneous count reading over the age of the sample since creation, which has been previously determined with, e.g., a 3-12% statistical error. The statistical requirement to be imposed on the instantaneous count should be more stringent, because additional errors in age determination, due to statistical fluctuation of the radioisotope particulates in the "ink" liquid, due to evaporation of the liquid itself, as well as due to some other known parameters, are here to be taken into account. Again, the information provided in the specification is not sufficient, if not even misleading, to teach a prospective user how to use Applicant's invention.

(e) On pg.10/line 10, in the expression "... until 1,000 spatially ..." the number 1,000 is not a fixed value, and hence, should better be declared as such, e.g., by adding the attribute "for example" next to the number. Thus, the specification does not provide a prospective user sufficient knowledge, how to use Applicant's invention.

(f) The specification fails to provide information, whether or not "modern strip gamma-ray detectors" have the same spectral capability as high-sensitivity and high-energy-resolution gamma detectors, as required to detect the tag counts distinctively above the background, as recited in the specifications on page 14/ lines 6-7.

(g) On pg. 16/ll. 6-21, *neutron activation* would incur additional errors in the count statistics necessary to properly read the digital information with sufficient accuracy (i.e., at least 1 part in 2^N). The feasibility of this neutron activation technique is not adequately described or at least mentioned in the specification, so as to teach a prospective user how to use Applicant's invention.

Appropriate corrections to (a)-(g) are required. However, Applicants are cautioned not to introduce New Matter into the specifications.

5. The Brief Description of the Drawings is objected to by the Examiner:

The Examiner suggests the following:

- (a) Figure 1 shows the placement of three watermarks on the surface of a dime.
- (b) Figure 2 shows the spectral image of a representative gamma watermark.

Claim Objections

6. Claims 29 and 34 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot have parent claims in the alternative (using the word "or"). See MPEP § 608.01(n). Accordingly, the claims 29 and 34 have not been further treated on the merits.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 6 and 50 are rejected under 35 U.S.C. 101 because the limitation that "at least one radioisotope comprises *radionuclides that are not practically detectable* in the pertinent environment of said tag" is essentially inoperative.

If the radiation is declared by Applicants as being *not detectable*, how would Applicants manage to detect the radionuclides without violating Applicants' own claim?

Claims 6 and 50 are also rejected under 35 USC 112, second paragraph (see next section).

8. Claim 25 is rejected under 35 U.S.C. 101 because the limitations are directed to non-statutory subject matter. Information about the source, origin, ownership and/or history of an object are abstract ideas which belong to non-statutory subject matter (see MPEP §706.03(a)).

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 11, 16, 23, 28, 41, 44, 50, 55, 58 and 61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claims 6 and 50 recite the limitation that "at least one radioisotope comprises ***radionuclides that are not practically detectable*** in the pertinent environment of said tag", which has been rejected under 35 USC 101 above. Claims 6 and 50 are also rejected under 35 USC § 112. It is well-known in the art that detection of a narrow gamma line having an intensity (much) below the overall (spectrally integrated) noise and/or background intensity level is very well possible by utilizing a spectrally resolving gamma detector to detect the narrow gamma line. Such a spectrally resolved measurement is not recited in claims 6 and 50, neither in the specification, the latter making only vague indications on page 6, lines 19-22 and on page 14 lines 6-7, however, without specifically identifying the use of narrow lines and high-resolution detectors to detect *radionuclides that are not practically detectable*.

Applicants are cautioned not to introduce New Matter upon obviating these rejections.

(b) Regarding claims 10, 11, 54 and 55, the limitation "wherein at least ***one*** radioisotope of said ***at least two*** radioisotopes comprises radionuclides" is self-contradictory, since it is generally known in the art that a radioisotope *always* consists of radionuclides. By definition, there is no radioisotope that does not contain radionuclides, and a group of atoms consisting of the same radionuclides is called a radioisotope. Consequently, if

there are *two* radioisotopes, then exactly *both of the two* radioisotopes *must* contain radionuclides, and *not just one of them* as claimed by the Applicants.

(c) Regarding claim 16, the additional limitation of "***from which the ink has been removed***" contradicts the remaining limitation of the claim as well as the specification. If the ink has been removed from the cartridge, then this cartridge would be empty, and hence, not possibly be able to deliver/dispense anything. Although a claim is to be interpreted in light of the specification, its limitations have to be expressed in a clear language that is capable of standing by itself.

Furthermore, the limitation or step of removing the ink from the cartridge is not supported by the specification

37 CFR 1.75 (d)1: The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (MPEP 608.01(i))

(d) Regarding claim 23, the phrase "the energy distribution is used ***to record of*** a unique signature" is not understandable to one of ordinary skill in the art.

Upon obviation of the current rejection under 35 U.S.C. 112, second paragraph, as best as the Examiner can ascertain in the claim, an energy distribution can not possibly be used ***to record*** any unique signature upon or within an object, but only to identify or characterize the object. In this case, the wording "***used as a unique signature***" would be more proper.

(e) Regarding claim 19, the limitation that the signature logos are "***visible to low energy gamma-ray watermark*** " is not understandable. To proceed forward with this

Office Action, the phrase has been changed to "*visible as ... watermarks*" by the Examiner. Should the Applicants disagree with this Examiner's amendment, a final correction of the phrase according to what Applicants really meant is to be made in reply to this Office Action.

(f) Regarding claim 28, the limitation of "flat surface" or "smooth surface" is a mere matter of (design) choice that cannot be given any patentable weight.

Furthermore, the limitations of "flat surface" and "smooth surface" are not supported by the specification (37 CFR 1.75 (d)1, MPEP 608.01(i))

(g) Regarding claims 44 and 61, the wording of the claims are not understandable to one of ordinary skill in the art, neither grammatically nor logically.

(h) Regarding claims 41 and 58, the phrase "the **ratio** of the intensities of two gamma-ray-emitting transitions of said at least two radioisotopes **is made equal** in said tag," does not make any sense: "**the ratio is made equal**" to what? In addition, the word "*by convention*" used in the claim must be particularly pointed out and distinctly claimed as, e.g., "*by convention, at the time they were created*".

In order to proceed forward with this Office Action, the objected phrase is amended to "*the ratio ... is made **equal to unity***" by the Examiner. Should the Applicants disagree with this Examiner's amendment, a final correction of the phrase according to what Applicants really meant has to be made in reply to this Office Action.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

11. Claims 1, 13 and 45 are rejected under 35 U.S.C. 102(b) and 102(e) as being anticipated by Kane et al. (USPAT 4,571,492).

Kane et al. invent a method of tagging an object with a tag, wherein Kane's method comprises affixing at least two radioisotopes to the object, as recited in Col.3/ll.63-68 and Col.4/ll.18-20, wherein the quantity of each radioisotope of the two or more radioisotopes is controlled to produce a controlled ratio of quantities of each radioisotope relative to the other, as recited in Col.4/ll.26-33 defining the isotope quantity as isotopic abundance, and in Col.7/ll.31-35 addressing the importance of ratio the ratio of these quantities, and wherein the controlled ratio encodes digital information within the tag which numeric content can be recovered over time-intervals, as recited in

Col.7/II.29-36, specifically addressing digital information in Col.7/II.39-41 and addressing information recovery over time-intervals in Col.7/II.29-68 and Col.8/II.1-11, specifically in the formula in Col.8/II.11, and further, the claim limitation "by use of appropriate detection apparatus" in Col.7/II.35-40.

Specifically regarding claim 13, Applicants' "relative mixture of radionuclides" is the same as Kane's ratio of radioisotope abundance disclosed in Col.7/II.40-44.

12. Claims 2, 18, 41-43, 46, and 57-60 are rejected under 35 U.S.C. 102(b) and 102(e) as being anticipated by Kane et al.

The limitations that "at least one radioisotope is employed to encode the time-since-creation of the tag" (claims 2 and 46), "determining the approximate date ... by measuring the decay of one or more radioisotopes of precisely known quantities and half lives" (claims 18 and 57), "at least two radioisotopes are employed to encode the time-of-creation of the tag", also "the intensity ratio of two radioisotopes of different half-lives is made to be *equal to unity* " (claims 41-43 and 58), and further limitations of claims 41-43 and 59-60, as well as "the observed ratio of line intensities constitutes a 'clock' whose 'elapsed time-reading' may be determined as precisely as desired simply by choosing how long to inspect the clock" (claims 41 and 58), are all encompassed in Kane's Col.7/II.29-68, especially in the formula given in Col.8/II.1-11. Regarding claims 59-60, the limitations that the age of the tag is determined by the fraction of the remaining radioactivities (claim 59), and particularly from their ratio translated back to

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the time of creation (claim 60), are also readily encompassed in Col.7/II.29-68 and Col.8/II.1-11.

13. Regarding claim 3, the limitation that the tag is employed for the purpose of object identification, is recited by Kane et al. In Col.4/II.21-32.

14. Regarding claims 4 and 48, the limitation that the quantity of each radioisotope does not exceed 1 microCurie at the time of creation, is disclosed by Kane et al. In Col.6/II.24-26. Furthermore, in anticipation of claim 29 having overcome the above objection under 35 CFR 1.75(s), the limitation that the amount is low level radioactivity is disclosed by Kane et al. in Col.3/II.35-40.

15. Regarding claims 6 and 50, insofar as the Examiner can ascertain in the claims upon obviation of the above rejections under 35 USC § 101 and § 112, 2nd paragraph, the use of narrow spectral lines as radioactive tags to ensure low radiation hazard to the environment is disclosed in Col.3/II.35-40.

16. Regarding claims 7 and 51, the limitation that at least one radioisotope comprises a radionuclide in a specified amount to encode the numerical content of a binary bit-string is disclosed in Col.6/II.19-22, Col.7/II.6-16, and Col.7/II.35-38, whereby the limitation that the numerical content of the binary bit-string is inherently understood in digital recording recited in Col.7/II.38-40. That the length of a binary bit-string is at least one bit, is a trivial limitation well known to one of ordinary skill in the art.

17. Regarding claims 8 and 52, the limitation that the tagged object comprises a material object essentially greater than microscopic scale is disclosed in Col.4/II.54-67, Col.10/II.21-25, and Col.11/II.3-9.

18. Regarding claims 10 and 54, insofar as the Examiner can ascertain in the claims upon obviation of the above rejections under 35 USC § 112, 2nd paragraph, the limitation that at least one radioisotope comprises radionuclides carried on a bead of an ion-exchange or zeolite variety, is inclusive in the group of radioisotopes recited in Col.9/II.63-68 and Col.10/II.1-13.

19. Regarding claims 11, 14 and 55, insofar as the Examiner can ascertain in the claims upon obviation of the above rejections of claims 11 and 55 under 35 USC § 112, 2nd paragraph, the limitation that the radionuclides are metered out from one or more solution-containing reservoir of an inkjet-type printing mechanism under algorithmic control, is disclosed in Col.9/II.59-68 and Col.10/II.1-4. In this regard, the limitation of dispensing the radioactive ink by a printing mechanism under algorithmic control (as opposed to manually) is an automation which is not patentable because it only involves routine skill in the art. *In re Venner*, 120 USPQ 192.

20. Regarding claim 12, the limitation of controlling the detection of the tag and numeric content read-out processes with a digital computer-implemented algorithmic means is disclosed in Col.9/II.38-49.

21. Regarding claim 15, the limitation that the resulting watermark delivered by an ink-jet cartridge is visible to the detector-and-collimator arrangement is disclosed in Col.2/ll.8-68 and continued to Col.3/ll.1-40.

22. Regarding claim 16, insofar as the Examiner can ascertain in the claim upon obviation of the above rejections under 35 USC § 112, 2nd paragraph, the limitation that the radioactive tags are incorporated invisibly onto previously existing objects, is disclosed in the Abstract, lines 1-4 from the end/bottom, and in Col.2/ll.27-32.

23. Regarding claims 17 and 56, the limitation that the radionuclides emit penetrating high-energy gamma rays is disclosed in Table II in Col.8.

24. Regarding claim 19, insofar as the Examiner can ascertain in the claim upon obviation of the above rejections under 35 USC § 112, 2nd paragraph, the limitation that the radioactive tag is created in the form of two dimensional logos visible **as** low energy gamma-ray watermarks is inherently understood in Col.1/ll.53-57 in conjunction with Col. 1/ll.47-50.

25. Regarding claims 26, 37 and 38, the limitations that the radioactive tag is "encoded in a spatial distribution of each radionuclide relative to the other(s)", "distributed throughout the tag", and "is placed in a limited area or volume of the tag", are all mere arrangements of the constituents, to make the tag two-dimensional. Where the instant specification and evidence of record fail to attribute any significance (novel or unexpected result) to a particular arrangement, the particular arrangement is deemed to

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have been a design consideration within skill of the art. In re Kuhle, 526 F.2d 553, 555, 188 USPQ 7; 9 (CCPA 1975).

26. Regarding claims 27, 39 and 40, the limitation that the radioactive tag pattern comprises a bar-code is rejected on the same basis as that applied to claim 26 above, in the sense that a bar-code is essentially a two dimensional distribution.

Specifically regarding claim 40, the limitation that the bar code of claim 39 is invisible, is trivial, since it is generally known that gamma rays are invisible to the eye.

27. Regarding claims 30 and 47, the limitation that the tagging method comprises (the step of) affixing the (radioactive) label to the object is disclosed in Col.9/II.59-62.

28. Regarding claim 31, the limitation that the tagged object comprises something which is often counterfeited is disclosed in Col.1/II.47-50.

29. Regarding claims 32, 33 and 35, the limitation that the objects to be tagged comprise currency is disclosed in Col.4/II.54-67 and Col.10/II.21-25; that they comprise documents (including computer output documents) is disclosed in Col.10/II.59-68 and Col.11/II.1-9.

Note: Computer software by itself (claim 33) is an abstract idea that cannot possibly be tagged.

30. Regarding claim 33, insofar as the Examiner can ascertain in the claim upon obviation of the above rejections under 35 USC § 101, the limitation that the objects to

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be tagged comprise computer output, which is no other than documents, is disclosed in Col.10/II.59-68 and Col.11/II.1-9.

31. Regarding claim 36, the limitation that the method in parent/base claim 17 comprises determining the presence of tagged documents in a set of documents by detecting the penetrating high-energy gamma rays, is disclosed in Col.3/II.25-31.

32. Regarding claims 44 and 61, insofar as the Examiner can ascertain in the claims upon obviation of the above rejections under 35 USC § 112, 2nd paragraph, the limitation that the ordering of the code blocks in the parent claims 43 and 60, respectively, is in an increasing order of gamma energy, is a mere matter of design choice. The ordering may be made in the reverse, i.e., decreasing order, or any other specific order, without giving any different result.

Claim Rejections - 35 USC § 103

324 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35. Claims 5, 9, 49 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kane et al. as applied to claims 1 and 45 above, and further in view of Monastra et al.

(a) Regarding claims 5 and 49, Kane et al. disclose all the limitations of claims 5 and 49 as applied to the respective base claims 1 and 45 above, except the limitation of encoding some redundancy in the digital bit-string representation of the tag.

Monastra et al. disclose a digital bit-string representation of an N-bit information which further encodes a C-bit redundancy to form a N+C bit data string, as illustrated in Fig.1 and recited in Col.1/II.28-36. Another example using a supernumerary bit redundancy $S=M-N$ is illustrated in Fig.3 and recited in Col.4/II.23-47.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to encode some redundancy in the bit-string representation, in order to incorporate an error-(protection/correction) coding in the bit-string, as disclosed by Monastra et al. in Col.1/II.36-46. Such an error-protection/correction coding by redundant bit data is a desirable option well known in the art, as recited by Monastra et al. in Col.1/II.46-49 because it improves the reliability of the system, as recited in Col.1/II.8-11.

(b) Regarding claims 9 and 53, Kane et al. disclose all the limitations of claims 9 and 53 as applied to the respective base claims 1, 5, 45 and 49 above, except the limitation that the redundancy comprises a Hamming error-syndrome. This limitation is disclosed by Monastra et al. in Col.1/II.36-37, reciting the redundant C-bits are used for error detection and correction (EDAC) coding, which is further specified as being associated with the Hamming error-syndrome, as disclosed in Col.11/II.42-44.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the Hamming error-syndrome as a bit-error detection

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code, since the code is one of the simplest in the art and also well suited for use with linear bit-strings.

36. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kane et al. as applied to the parent/base claims 19 and 13 above, and further in view of Gullberg et al.

Kane et al. disclose all the limitations of claims 20-22 as applied to the respective base claims 13 and 19 above, except the limitations of using a modern strip gamma-ray detector, a Compton gamma-ray imaging detectors, or using gamma-ray tomography,

Gullberg et al. disclose in Fig. 1 and Figs. 2A & 2B a gamma imaging system for detecting radionuclide *distributions*, as disclosed in Col.1/ll.18-20. Gullberg's gamma detecting system is based on a modern strip gamma-ray detector, i.e., one dimensional detectors 30a and 30b, as disclosed in Col.3/ll.60-64, while making use of the Compton effect, as disclosed in Col.1/ll.58-67, Col.2/ll.1-67 and Col.3/ll.60-67 & Col.4/ll.1-4 as well as in other parts of the specification. Gullberg's gamma camera is basically a computer tomography imaging system capable of imaging a three-dimensional distribution of gamma emitters, as recited in Col.3/ll.28-31, Col.7/ll.65-67 and Col.8/ll.1-10.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use a Compton gamma imaging system such as Gullberg's to detect a *distribution* of gamma emitters, such as two-dimensional signature logos and three-dimensional signatures, since it is well-known in the art that the Compton effect can be utilized to determine the direction or angle of a gamma emission and

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simultaneously its wavelength, as disclosed by Gullberg et al. in Col.4/II.5-20, thus obviating the need of high spectral resolution detectors.

It would have been further obvious to a person having ordinary skill in the art at the time the invention was made to use Gullberg's Compton camera, since it can be used for conventional SPECT tomography, as specifically recited in Col.3/II.28-31, and is therefore capable of imaging low-level gamma source distributions, so low as not to harm human body, as required by Kane et al. in Col.3/II.35-40.

Suggestion to use a difficult-to-counterfeit logo to tag a valuable or genuine product is implicated by Kane et al. in Col.1/II.50-60.

37. Insofar as the Examiner can ascertain in the claim upon obviation of the above rejections under 35 USC § 112, 2nd paragraph, claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kane et al. as applied to the parent/base claim 23 above, and further in view of Myron.

Kane et al. disclose all the limitations of claims 23 and 24, except the limitation of using a high-energy radioactive ion beam with characteristic distributions of energy (claim 23) and direction (claim 24), such that -- as a result of the stopping power of the implanted material -- the implanted radioactive ions have a specific distribution that serves as a three dimensionally extended radioactive tag.

Myron discloses a method of ion beam implantation that results in a **controlled implant distribution**, as recited in Col.1/II.6-10, 24-26, and 39-43. The fact that Myron uses his method to make the distribution more uniform does not at all teaches away from Applicants' invention, since Applicants do not specify the unique ion distribution

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being claimed. An **uncontrolled** ion implantation would certainly result in a non-uniform implant distribution, such that Myron's uniform distribution can certainly be considered as a unique distribution, thus anticipating the limitations of claims 23 and 24.

Furthermore, Myron's implantation method is controlled, and thus may be used to produce any implant distribution as desired, and not just a uniform one. Thus, Myron's method is capable of implanting ions, including radioactive ions, to generate any unique distribution desired to form a unique signature desired, uniform as well as non-uniform.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use Myron's controlled implantation method to implant radioactive ions with a unique implant distribution profile, since the latter is a 3-dimensional logical extension of a 2-dimensional logo pattern that would further enhance the uniqueness.


One would have been motivated to make a 3-dimensional tag, since it is quite obvious to every one not necessarily skilled in the art that a unique 3-dimensional logo is more difficult to counterfeit than a 2-dimensional logo, and is *much* more difficult to counterfeit than a simple spot-like tag, whereby the unique spatial distribution may substitute an isotopic/spectral constituents, or even added on top of a unique isotopic combination to enhance its uniqueness.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

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